



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/813,157

03/31/2004

Youn-joon Sung

030681-642

4476

21839

7590

04/03/2009

BUCHANAN, INGERSOLL & ROONEY PC  
POST OFFICE BOX 1404  
ALEXANDRIA, VA 22313-1404

EXAMINER

GOLUB, MARCIA A

ART UNIT

PAPER NUMBER

2828

NOTIFICATION DATE

DELIVERY MODE

04/03/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/813,157	<b>Applicant(s)</b> SUNG ET AL.	
	<b>Examiner</b> MARCIA A. GOLUB	<b>Art Unit</b> 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-23 is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments have been fully considered but they are moot in view of new grounds of rejection. Applicant has amended the claims such that they are now inconsistent with the specification.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

**Claims 1-10** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1 describes the upper surface of the ridge formed of the buried layer, the protective layer and the upper material layer. This is inconsistent with the specification that discloses a ridge formed of the upper material layer only, with the buried and protective layers formed on top of the ridge.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claim 1-10** are rejected under 35 U.S.C. 102(b) as being anticipated by Kozaki (US 2002/00536760).

Fig 1 of Kozaki discloses a laser diode comprising:

1. “a substrate [101];  
a lower material layer [102-105] formed on the substrate [101];

a resonance layer [106-109] formed on the lower material layer [102-105];  
an upper material layer [110-111] formed on the resonance layer [102-105] and having a ridge at the top;

a buried layer [162] formed on the upper material layer [110-111] and having a contact hole corresponding to the ridge of the upper material layer; (paragraph 0232)

a protective layer [164] formed on the buried layer [162] and having a material different from the material of the buried layer, and having an opening corresponding to the contact hole of the buried layer (paragraph 0173); and

an upper electrode [120,122] formed on the protective layer [164] to contact an upper surface of the ridge through the contact hole,

wherein the upper surface of the ridge is planar (there are no curved surfaces on top of the ridge)

such that the upper electrode [120,122] is in direct contact with each of the upper material layer [111], the buried layer [162], and the protective layer [164].”

2. wherein the lower material layer includes: a first compound semiconductor layer [103] stacked on the substrate [101]; and a lower cladding layer [105] stacked on the first compound semiconductor layer [103].

3. wherein the first compound semiconductor layer [103] is an n-GaN based group III-V nitride semiconductor layer (paragraphs 0065 and 0150).

4. wherein the lower cladding layer [105] is an n-GaN/AlGaN layer (paragraph 0154).

5. wherein the resonance layer further includes:

a lower waveguide layer [106] stacked on the lower cladding layer [105] and having a refractive index larger than that of the lower cladding layer (paragraph 0037);

an active layer [107] stacked on the upper surface of the lower waveguide layer [106] to generate a laser beam; and

an upper waveguide layer [109] stacked on the active layer [107].

6. wherein the refractive indexes of the upper and lower waveguide layers are lower than the refractive index of the active layer (paragraph 0037).

7. wherein the active layer [107] is a GaN based group III-V nitride compound

semiconductor layer of  $\text{In}_x\text{Al}_y\text{Ga}_{1-x-y}\text{N}$  where  $0 \leq x \leq 1$ ,  $0 \leq y \leq 1$ , and  $x+y \leq 1$  (paragraph 0065).

8. wherein the upper material layer includes:

an upper cladding layer [110] stacked on the upper waveguide [109] layer and having a ridge (paragraph 0126) and a refractive index smaller than that of the upper waveguide layer (paragraph 0037);

a second compound semiconductor layer [111] formed on the ridge (paragraph 0166).

9. wherein the upper cladding layer [110] is a p-GaN/AlGaN layer (paragraph 0164).

10. wherein the second compound semiconductor layer [111] is a p-GaN based group III-V nitride semiconductor layer (paragraph 0166).

#### ***Allowable Subject Matter***

**Claims 11-23** are allowed.

The following is an examiner's statement of reasons for allowance: the prior art of records does not disclose or suggest to combine a manufacturing method for making a laser diode as described in the claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

#### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

***Contact Info***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARCIA A. GOLUB-MILLER whose telephone number is (571)272-8602. The examiner can normally be reached on M-Th 9:30-6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marcia A. Golub-Miller/

/ARMANDO RODRIGUEZ/

Primary Examiner, Art Unit 2828